AMENDMENTS TO THE CLAIMS

1. (Currently amended) An endolumenal prosthesis having a lumenal surface and an ablumenal surface, comprising:

a tubular wire support with proximal and distal ends and a central lumen extending therebetween, the wire support comprising at least two axially adjacent tubular segments, each segment comprising a series of proximal and distal bends connected by a length of wire, wherein the wire support is radially compressible into a first, reduced cross sectional configuration for translumenal navigation to a treatment site in a body lumen and self expandable to a second, enlarged cross sectional configuration for deployment at the treatment site in the body lumen; and

a tubular ePTFE sheath on the wire support, the tubular sheath being configured to inhibit the formation of a viable neointimal layer on the lumenal surface of the sheath along the sheath's entire axial length.

2. (Original) The endolumenal prosthesis of Claim 1, wherein the ePTFE sheath has a wall thickness of no greater than about 0.2 mm.

3. (Original) The endolumenal prosthesis of Claim 1, wherein the ePTFE sheath has a wall thickness within the range of from about 0.05 mm to about 0.15 mm.

4. (Original) The endolumenal prosthesis of Claim 2, wherein the ePTFE sheath has a wall thickness of about 0.1 mm.

5. (Original) The endolumenal prosthesis of Claim 1, wherein the ePTFE sheath has a density of at least about 0.5 grams per milliliter.

6. (Original) The endolumenal prosthesis of Claim 3, wherein the ePTFE sheath has a density of at least about 0.75 grams per milliliter.

7. (Original) The endolumenal prosthesis of Claim 3, wherein the ePTFE sheath has a density within the range of from about 1.1 to about 1.5 grams per milliliter.

8. (Original) The endolumenal prosthesis of Claim 1, wherein the ePTFE sheath has a plurality of nodes, and the average distance between nodes is within the range of from about 6 microns to about 80 microns.

9. (Original) The endolumenal prosthesis of Claim 3, wherein the ePTFE sheath has a plurality of nodes, and the average distance between nodes is within the range of from about 6 microns to about 80 microns.

10. (Original) The endolumenal prosthesis of Claim 6, wherein the ePTFE sheath has a plurality of nodes, and the average distance between nodes is within the range of from about 6 microns to about 80 microns.

11. (Original) The endolumenal prosthesis of Claim 2, comprising at least three segments.

12. (Original) The endolumenal prosthesis of Claim 2, comprising at least five segments.

13. (Original) The endolumenal prosthesis of Claim 2, wherein each segment comprises from about 4 proximal bends to about 12 proximal bends.

14. (Original) The endolumenal prosthesis of Claim 2, wherein the tubular sheath comprises two membranes, a first membrane along the lumenal surface of the wire support and a second membrane along the exterior surface of the wire support, such that at least a portion of the wire support is embedded between the first and second membranes.

15. (Original) The endolumenal prosthesis of Claim 2, wherein at least the first and second axially adjacent tubular segments are joined by at least one folded link extending therebetween.

16. (Original) The endolumenal prosthesis of Claim 15, wherein the first tubular segment includes two side-by-side legs with a first apex thereon and the folded link is formed by folding around the first apex around a second apex formed on the second tubular segment.

17. (Original) The endolumenal prosthesis of Claim 1, wherein the ePTFE sheath has a water entry pressure in the range of from about 10 psi to about 24 psi.

18. (Currently amended) A bifurcated endolumenal prosthesis having a lumenal surface and an ablumenal surface, comprising:

a proximal wire support section having a proximal end, a distal end and a central lumen extending therethrough, the proximal support section comprising at least two axially adjacent tubular segments comprising a series of distal and proximal bends connected by struts;

a first wire branch section at the distal end of the proximal support;

a second wire branch section at the distal end of the proximal support; and

a membrane carried by the wire support section, the membrane having a membrane proximal end region and a membrane distal end region and configured to inhibit cellular growth through the membrane which would be sufficient to enable the formation of a thin, viable neointimal layer on the lumenal surface of the membrane at least at the membrane proximal and distal end regions.

19. (Currently amended) A prosthetic vascular structure, comprising:

expanded polytetrafluoroethylene, said expanded polytetrafluoroethylene comprising:

(i) a macroscopically tubular configuration with a proximal end and a distal end and an inner surface;

(ii) a microscopic superstructure of irregularly spaced nodes of various sizes and shapes interconnected by fibrils;

said vascular structure further comprising:

a. an average wall thickness of less than about 0.2 millimeters;

b. a substantially uniform distribution of nodes throughout said tubular configuration; and

c. an average density of greater than about 0.5 grams per milliliter;

wherein ~~whereby~~ said structure may provide for the smooth flow of blood between at least two points in a living organism while controlling cellular ingrowth through the wall of the tubular configuration to substantially prevent the formation of a thin, viable neointima over the inner surface thereof from the proximal end to the distal end.

20. (Original) The endolumenal prosthesis of Claim 19, wherein the ePTFE sheath has a wall thickness of no greater than about 0.2 mm.

21. (Original) The endolumenal prosthesis of Claim 19, wherein the ePTFE sheath has a wall thickness within the range of from about 0.05 mm to about 0.15 mm.

22. (Original) The endolumenal prosthesis of Claim 20, wherein the ePTFE sheath has a wall thickness of about 0.1 mm.

23. (Original) The endolumenal prosthesis of Claim 19, wherein the ePTFE sheath has a density of at least about 0.5 grams per milliliter.

24. (Original) The endolumenal prosthesis of Claim 21, wherein the ePTFE sheath has a density of at least about 0.75 grams per milliliter.

25. (Original) The endolumenal prosthesis of Claim 21, wherein the ePTFE sheath has a density within the range of from about 1.1 to about 1.5 grams per milliliter.

26. (Original) The endolumenal prosthesis of Claim 19, wherein the ePTFE sheath has a plurality of nodes, and the average distance between nodes is within the range of from about 6 microns to about 80 microns.

27. (Original) The endolumenal prosthesis of Claim 21, wherein the ePTFE sheath has a plurality of nodes, and the average distance between nodes is within the range of from about 6 microns to about 80 microns.

28. (Original) The endolumenal prosthesis of Claim 24, wherein the ePTFE sheath has a plurality of nodes, and the average distance between nodes is within the range of from about 6 microns to about 80 microns.

29. (Original) The endolumenal prosthesis of Claim 19, wherein the tubular support is self expandable.

30. (Original) The endolumenal prosthesis of Claim 19, wherein the tubular support is balloon expandable.

31. (Currently amended) A prosthetic vascular graft, comprising:

an expandable tubular wire support;

a tubular ePTFE layer carried by the support, the ePTFE layer having:

a wall thickness of less than about 0.15 millimeters;

an average density of greater than about 0.75 grams per milliliter; and

an average distance between nodes in the range of between about 6 to about 80 microns;

so that the ePTFE layer prevents the formation and nourishment of a viable neointimal layer therethrough along the tubular ePTFE layer's axial length.

32. (Currently amended) An artificial vascular prosthesis comprising an enlargeable support structure having an expanded, porous, polytetrafluoroethylene layer thereon, the layer

having a microstructure consisting of nodes interconnected by fibrils which prevents tissue ingrowth along the layer's axial dimension, in which either the density is greater than about 1 gram per milliliter or the wall thickness is less than about 0.2 millimeters, or both.

33. (Currently amended) A method of treating a patient, comprising the steps of:

providing an implantable tubular prosthesis, having an ePTFE layer thereon, the ePTFE layer having a proximal end and a distal end;

positioning the prosthesis across a defect in a vessel such that a first side of the layer is in contact with the wall of the vessel; and

inhibiting formation of a viable neointima on a second side of the layer from the proximal end to the distal end, nourished through the layer;

wherein the inhibiting step comprises providing the ePTFE layer with a density of greater than about 0.75 grams per milliliter and a wall thickness of less than 0.2 mm.

34. (Currently amended) An endolumenal prosthesis having a lumenal surface and an ablumenal surface, comprising:

a tubular wire support with proximal and distal ends and a central lumen extending therebetween, the wire support comprising at least two axially adjacent tubular segments, each segment comprising a series of proximal and distal bends wherein the wire support is radially compressible into a first, reduced cross sectional configuration for translumenal navigation to a treatment site in a body lumen and self expandable to a second, enlarged cross sectional configuration for deployment at the treatment site in the body lumen; and

a tubular ePTFE sheath on the wire support, the tubular sheath having a proximal end and a distal end and being configured to have a water entry pressure of at least about 10 psi, and wherein the tubular sheath is configured to inhibit the formation of a viable neointimal layer on the lumenal surface of the sheath at the proximal end.

35. (Original) The endolumenal prosthesis of Claim 34, wherein the ePTFE sheath has a wall thickness of no greater than about 0.2 mm.

36. (Original) The endolumenal prosthesis of Claim 34, wherein the ePTFE sheath has a wall thickness within the range of from about 0.05 mm to about 0.15 mm.

37. (Original) The endolumenal prosthesis of Claim 35, wherein the ePTFE sheath has a wall thickness of about 0.1 mm.

38. (Original) The endolumenal prosthesis of Claim 34, wherein the ePTFE sheath has a density of at least about 0.5 grams per milliliter.

39. (Original) The endolumenal prosthesis of Claim 36, wherein the ePTFE sheath has a density of at least about 0.75 grams per milliliter.

40. (Original) The endolumenal prosthesis of Claim 36, wherein the ePTFE sheath has a density within the range of from about 1.1 to about 1.5 grams per milliliter.

41. (Original) The endolumenal prosthesis of Claim 34, wherein the ePTFE sheath has a plurality of nodes, and the average distance between nodes is within the range of from about 6 microns to about 80 microns.

42. (Original) The endolumenal prosthesis of Claim 36, wherein the ePTFE sheath has a plurality of nodes, and the average distance between nodes is within the range of from about 6 microns to about 80 microns.

43. (Original) The endolumenal prosthesis of Claim 39, wherein the ePTFE sheath has a plurality of nodes, and the average distance between nodes is within the range of from about 6 microns to about 80 microns.

44. (New) The endolumenal prosthesis of Claim 34, wherein the tubular sheath is further configured to inhibit the formation of a viable neointimal layer on the lumenal surface of the sheath at the distal end.